

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/026,171 Confirmation No. 9429
Applicant : Agapios Agapiou, et al.
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Commissioner for Patents
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DECLARATION UNDER 37 CFR § 1.132

Sir:

I, Chi-I Kuo, declare as follows:

I am a co-inventor of the description and all the claimed subject matter in the above referenced patent application. The purpose of this Declaration is to demonstrate that the claims describing heating techniques used in the reaction between metallocenes and methyl alumoxane (MAO) resulted in unexpected and surprising improvement (lowering) of reactor fouling and maintenance or improvement in catalyst activity, when compared to no added heat during the reaction between the metallocenes and MAO. The techniques claimed, furthermore, are not disclosed in either WO 96/35729 or US 5,914,289 (Razavi I or II). In the examination of the above referred patent application, the Examiner relies on these two references, Razavi I and/or Razavi II, in rejecting the claims. Under my direction and control, a series of experiments was conducted to evaluate the catalyst preparation techniques of these two references and compare these reference techniques to our claimed techniques.

Catalyst Preparation Comparing Univation and Razavi I&II Methods**Univation Catalyst Preparation**

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weighing the cooled resin. Notes and photos about fouling characteristics of each polymer are included in the accompanying documentation of the runs.

As table 1 and the photos clearly indicate, pre-heating the metallocene/MAO mixture prior to heating it with silica is critical to obtaining the improved (lower) fouling and (higher) catalyst activity performance. A catalyst was made (00277-132-2) using the standard conditions for the examples in the Razavi documents (no pre-heating of the metallocene/MAO mixture, but heating the metallocene/MAO/silica mixture at 110°C for 90 minutes) and polymerized in a 2.2 liter autoclave reactor. The resulting polymer fouled the reactor badly (see photos 78 & 79, attached, corresponding to polymerization runs 00311-78 & 00311-79 respectively). When a catalyst was made in run 00311-80 using identical reagents to the ones in the above example but with pre-heating the metallocene/MAO mixture prior to silica deposition/reaction(as presently claimed), the resulting polymer after polymerization at identical conditions exhibited granular morphology and no fouling was observed (photo 80).

We believe that the importance of the pre-heating step (our invention) is paramount to obtaining a non-fouling catalyst when using bridged metallocenes because driving the sparingly soluble metallocene reaction with MAO to the complete ion pair, allows the totally soluble catalyst component to stay chemically attached to the support and thus prevent fouling.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 or Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application or an patent issuing therefrom.

Respectfully submitted,

2-23-2006

Date

Chi-I Kuo

Chi-I Kuo